

NRO REVIEW COMPLETED

112-A CAMERA SYSTEM  
DATA

EXCLUDED FROM AUTOMATIC REGRADING;  
DOD DIR. 5200.10 DOES NOT APPLY

NRO 25X1

SECRET

The inclosed data have been prepared to provide information on the 112-A Camera System to make possible the maximum utilization of the photography from this system.

10 October 1963

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112-A CAMERA SYSTEM

A. TYPE OF PHOTOGRAPHY

A single high acuity panoramic camera is mounted in a high altitude aircraft. The panoramic scan ( a moving shutter slit traverses the film at a constant rate) sweeps  $70^{\circ}$  across the flight line -  $35^{\circ}$  on either side. The forward overlap is 55%. The camera has a focal length of 24" and images on 70 mm film.

B. CAMERA OPTICS

Lens Design - Petzval

Focal Length - 24"

Aperture - f/3.5

Half field angle -  $2^{\circ} 41'$

Filter - Wratten 21

C. CAMERA DATA

Film Capacity - 7,800 ft

Shutter Slit Widths Available - .02" to .3"

Cycle period - scan rate data. Settings available -

3.5 second cycle has 1.795 rad/sec scan rate

4.0 second cycle has 1.571 rad-sec scan rate

4.5 second cycle has 1.396 rad/sec scan rate

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D. PHOTOGRAPHIC COVERAGE

Altitudes - 65,000 ft to 75,000 ft

Vehicle velocity - 415 Knots

Scales - 1/35,000 at the Nadir from 70,000 ft altitude

Stereo/Convergence - 55% Forward Overlap, No Convergence

Transverse Coverage - 70° Total

Linear Coverage - 5° 22' at the Nadir (In direction of flight)

Roll Position - The Camera is mounted in the aircraft in a nominal vertical position.

E. IMAGE MOTION COMPENSATION

The lens barrel rotates about the node to achieve the panoramic scan, imaging onto the film surface which is a section of a cylinder. At the same time that the scanning arm is rotating, the lens barrel is translated toward the direction of vehicle motion. The rate of this translation is variable and is designed to compensate for the forward image motion at the focal plane. The rate of this translation for IMC at any point on the format is dependent upon the slant range (obliquity of scan), velocity, focal length and altitude.

The equation of the path of the moving principle point is:

$$Y = .1611 \sin \theta$$

Where  $\theta$  is the transverse obliquity angle and Y is the direction of flight and is expressed in inches. See Drawing.

F. FILM DATA

TYPE - S.O. 130 (Type 4400), S.O. 206, S.O. 132 (Type 4404)

BASE - ESTAR Base

THICKNESS - 3.2 Mil

WIDTH - 70 mm

G. FLIGHT DATA

There is no Flight Data on the Format

H. SYSTEM CAPABILITIES (Dynamic Resolution)

Ground Resolutions of 1 to 1.5 ft. are expected

I. A TRACKER CAMERA (#1) WILL BE USED IN THIS SYSTEM

This panoramic camera has a focal length of 3" and uses 70 mm film on a 1,000 ft spool. The camera uses a rotating prism to scan from horizon to horizon. Format size is 2.37" x 9.44" and forward overlap is 55-60%.

The purpose of this camera is to aid in plotting the mission coverage and to provide some indication of aircraft attitude at the time of exposure.

A clock image appears on each frame.

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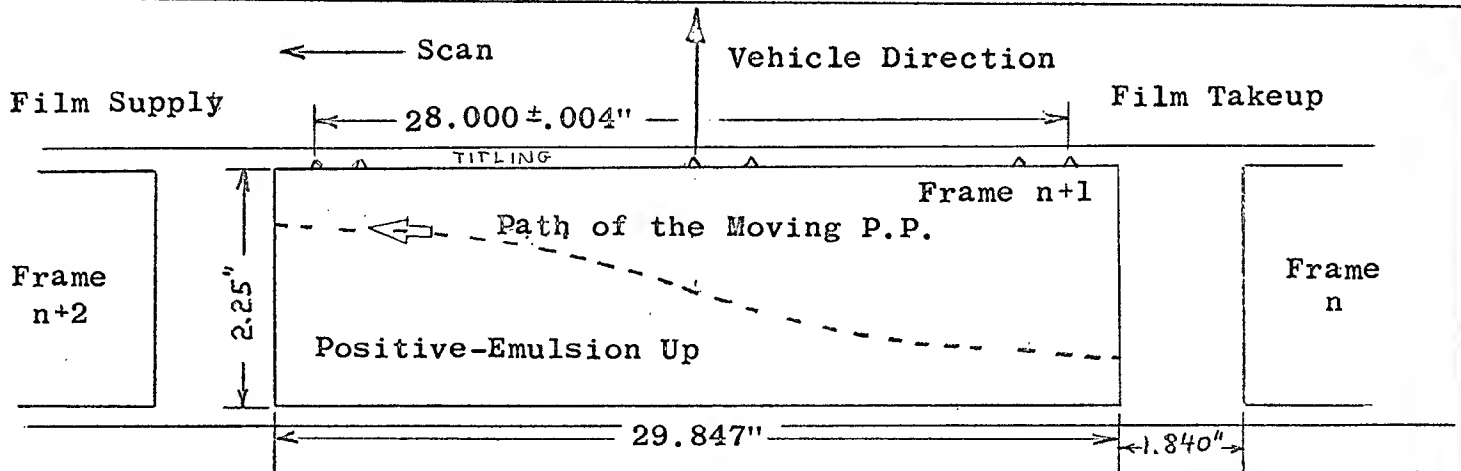
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Camera Scan Direction

Flight Direction

Ground Scan

55% Forward Overlap



Drawings are not to scale

25X1